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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/881,218	06/13/2001	Ansheng Liu	042390P11429	7592

7590

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EXAMINER

PRITCHETT, JOSHUA L

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 02/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/881,218

Applicant(s)

LIU ET AL.

Examiner

Joshua L Pritchett

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4, 7 and 30-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 30-35 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 7 and 36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

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DETAILED ACTION

This action is in response to the Request for Continued Examination filed December 1, 2003. Claims 1, 4 and 7 have been amended and claim 8 has been cancelled as requested by the applicant.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4, 7 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodfellow in view of Kondo (US 4,984,894).

Regarding claim 1, Goodfellow discloses directing an optical beam into a first end of an optical path having the first end and a second end disposed in a semiconductor substrate (col. 3 line 19); reflecting a first portion of the optical beam having a first center wavelength back out from the first end of the optical path (col. 3 lines 35-36; Fig. 2A). Goodfellow further teaches tuning the optical path to reflect a second portion of the optical beam having a second center wavelength back out from the first end of the optical path (col. 3 lines 15-18). Goodfellow lacks

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specific reference to first and second silicon materials disposed along the substrate. Kondo teaches it is well known to use a first and second plurality of silicon and polysilicon interfaces to reflect incident light. Kondo Fig. 2A shows a well known reflective grating structure with a layer of polysilicon (44) between two layers of silicon material (46 and 42), thus creating a first and second plurality of interfaces. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the reflective grating of Goodfellow be the reflective grating taught by Kondo for the purpose of efficiently reflecting the incident light.

Regarding claim 2, Goodfellow teaches confining the optical beam to remain within the optical path between the first and second ends with an optical waveguide disposed in the semiconductor substrate between the first and second ends (col. 3 lines 24-26).

Regarding claim 4, Goodfellow teaches wherein tuning the optical path comprises adjusting a temperature of the first material and the second material with a heater disposed proximate to the optical path through the semiconductor substrate (col. 3 lines 16-19). The use of first and second silicon materials is discussed in the rejection of claim 1 above.

Regarding claim 7, Goodfellow teaches alternating the first material and the second material in the semiconductor substrate along the optical path forms a Bragg grating (col. 3 lines 32-34). The use of first and second silicon materials is discussed in the rejection of claim 1 above.

Regarding claim 36, Goodfellow teaches wherein confining the optical beam to remain within the waveguide comprises forming the optical waveguide with dielectric layers of silicon-on-insulator wafer (col. 4 lines 9-17).

Response to Arguments

Applicant's arguments, see Amendment, filed December 1, 2003, with respect to the rejection(s) of claim(s) 1, 2, 4, 7 and 36 under Goodfellow have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Goodfellow in view of Kondo.

Applicant's arguments, see Amendment, filed December 1, 2003, with respect to claims 30-35 have been fully considered and are persuasive. The rejection of claims 30-35 has been withdrawn.

Allowable Subject Matter

Claims 30-35 allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claim 30, the prior art of record fails to teach or suggest the use of a plurality of insulated conductor structures protruding into the optical path disposed in a semiconductor substrate and reflecting a first portion of the optical beam back out the first end of the optical path.

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Regarding claims 31-35, claims 31-35 depend from claim 30 and are therefore allowable for the same reasons.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

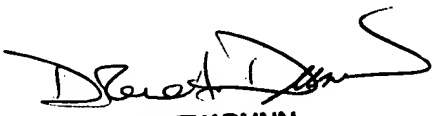
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L Pritchett whose telephone number is 703-305-7917, until January 20, 2004, after that date the examiner's telephone number will be 571-272-2318. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A Dunn can be reached on 703-305-0024. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9318.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JLP



DREW DUNN
SUPERVISORY PATENT EXAMINER